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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,096	10/15/2001	Tetsuya Itano	35.C15873	9346

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

MOE, AUNG SOE

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,096

Applicant(s)

ITANO ET AL.

Examiner

Aung S. Moe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 7-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 2/10/2006 have been fully considered but they are not persuasive.

In page 7 of the remarks, the Applicant alleged that Meyers does not disclose or suggest that light incident on the predetermined spaces is focused downward in the predetermined spaces by micro-lenses arranged on the predetermined spaces, as recited in independent claim 1.

In response, the Examiner respectfully disagrees because as shown in Figs. 1 and 2, the micro-lenses (i.e., the lens-lets array 10) are arranged on the predetermine spaces (noted that non-sensor areas surrounding the photo-detector 24 is also covered by the lens-lets array 10/12 as shown in Figs. 1A and 2), so that when the light incident on the predetermined spaces (i.e., noted the light entering on the edge of the sub-group of photo-detectors 22 as shown in Fig. 2), the incident light on the predetermined spaces is focused downward (i.e., noted the incident light-ray entering on the lens-lets array 10/12; as shown in Figs. 2 and 9; also noted from Figs. 3A/4A showing how incident light is focused downward) in the predetermined spaces by the micro-lenses (10/12) arranged on the predetermined spaces (i.e., noted that the lens-lets array 10/12 is clearly arranged over the predetermined spaces between the sub-group of photo-detectors 22; see Figs. 1A and 2).

In view of the above, Meyers '535 clearly discloses the newly added limitations "wherein light incident on the predetermined space (i.e., noted the incident light entering on the edge of the sensor group 22 as shown in Fig. 2) is focused downward in the predetermined spaces (i.e., noted the downward focused rays provided by the lens-lets rays 10/12 as shown in

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Figs. 2 and 9) by the micro-lenses (12/10) arranged on the predetermined spaces (i.e., noted the non-sensor areas surrounding the sub-group of photo-detectors 22 as shown in Figs. 1A and 2).

Moreover, Li '037 further teaches that it is conventionally well known to provide plurality of micro-lenses (i.e., Figs. 1A and 3; noted the micro-lenses 108/304) for each pixels (136/320). In addition, it is also obvious from the teaching of Li '037 that the sensors 136/320, . . . , 144/328 are arranged with a predetermined spaces there between, and the micro-lenses (108, 112, 116 or 304, 308 & 312) are arranged on the sensors also covered the predetermined spaces between the sensors, and when the light incident on the predetermined spaces (i.e., the edge of the micro-lenses covered the predetermined non-sensor spaces), the light is focused downward in the predetermined spaces as required by present claimed invention.

In view of the above, the Examiner asserts that combination of Meyers '535 and Li '037 clearly meet the claimed limitations as amended in Claim 1 of present claimed invention, and the Examiner will maintains the previous rejection as follow:

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyers (U.S. 6,137,535) in view of Li (U.S. 2002/0176037).

Regarding claim 1, Meyers '535 discloses an image pickup apparatus (Fig. 1 and 9) comprising: a plurality of pixel areas (i.e., the area 22 as shown in Fig. 1) arranged on a single semiconductor chip (100) to be adjacent to each other through a predetermined space (i.e., noted the space between the sub-group 22 as shown in Figs. 1 and 2), each of said pixel areas having pixels arranged two-dimensionally (i.e., noted the row and column of photo-detector 24 as shown in Fig. 1), each of the pixels having a photoelectric conversion unit (24); and

a plurality of micro-lenses (i.e., noted the elements 10/12) for forming light into images, wherein said plurality of micro-lenses (10/12) are arranged on said plurality of pixel areas (22) and arranged on the predetermined spaces between said plurality of pixel areas (i.e., noted the lenslet array 10 formed on the predetermined spaces between the sub-group 22 as shown in Figs. 1 and 2);

wherein light incident on the predetermined space (i.e., noted the incident light entering on the edge of the sensor group 22 as shown in Fig. 2) is focused downward in the predetermined spaces (i.e., noted the downward focused rays provided by the lens-lets rays 10/12 as shown in Figs. 2 and 9) by the micro-lenses (12/10) arranged on the predetermined spaces (i.e., noted the non-sensor areas surrounding the sub-group of photo-detectors 22 as shown in Figs. 1A and 2).

Furthermore, it is noted that although Meyers '535 show the plurality of micro-lenses (10/12) are arranged on the plurality of pixel areas (22) which are arranged on the predetermined spaces between the plurality of pixel areas (noted the predetermined spaces between the pixel areas 24 as shown in Fig. 1A), Meyers '535 does not explicitly show that *the plurality of micro-lenses* are arranged on the plurality of pixel *areas corresponding to each of the pixels* as recited in present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Li '037. In particular, Li '037 teaches that in order to increase the reliability of image sensor (i.e., see Abstract), it is desirable to arrange the plurality of micro-lenses (i.e., the elements 304, 308 and 312 as shown in Fig. 3) on the plurality of pixel areas corresponding to each of the pixels (as shown in Fig. 3, the micro-lenses 304, 308 and 312 are corresponding to the each pixels 320, 324 and 328 of the image sensor; see paragraphs 0021+).

In view of the above, having the system of Meyers '535 and then given the well-established teaching of Li '037, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Meyers '535 as taught by Li '037,

since Li '037 stated in the abstract and the paragraphs 0019+ that such a modification would increase device reliability and further improve resolution of the image sensor device thereof.

Regarding claim 3, Meyers '535 discloses an apparatus according to claim 1 (i.e., see above), wherein said plurality of pixel areas (22) comprise at least first, second, and third pixel areas (i.e., noted the color pixel area as shown in Fig. 1B), said first pixel area receiving a first color component from an object, said second pixel area receiving a second color component from the object, and said third pixel area receiving a third color component from the object (i.e., noted that each sub-groups 22 has a pixel areas 24 for receiving a different color component from an object, such as Red, Green and Blue, thus, the plurality of pixel area 22 comprises red pixel area, green pixel areas and blues pixel area for each pixel 24).

Regarding claim 4, Meyers '535 discloses an apparatus according to claim 3 (see above), wherein the first color component is a red component (i.e., noted the read color component of the pixel area 24 of one of the sub-group 22 as shown in Figs. 1B and 2), the second color component is a green component (i.e., noted the green color component of the pixel area 24 of one of the sub-group 22 as shown in Figs. 1B and 2), and the third color component is a blue component (i.e., noted the green color component of the pixel area 24 of one of the sub-group 22 as shown in Figs. 1B and 2).

Regarding claim 5, Meyers '535 discloses an apparatus according to claim 1 (see above), further comprising a plurality of lenses (i.e., see Figs. 1-2; col. 7, lines 35-50) for forming light into images, said lenses being provided corresponding to said respective pixel areas (i.e., see Figs. 1-2; col. 12, lines 15+).

Regarding claim 6, Meyers '535 discloses an apparatus according to claim 1 (see above), further comprising: a signal processing unit adapted to form an image by synthesizing signals respectively output from said plurality of pixel areas (i.e., noted from Fig. 9, that the image sensor 100 is normally used in the digital camera, and Meyers '535 stated in col. 3, lines 50-55 that the image signals from the sub-groups are synthesized to produced a large high resolution, thus, the digital camera system of Meyers '535 must includes a signal processing unit to synthesizing signals output from the plurality of sub-groups 22 to produce a composite image);

a timing generator adapted to drive said plurality of pixel areas and said signal processing unit; and a control and operation unit adapted to control said signal processing unit and said timing generator (i.e., noted that the sensor 100 contains a bus 50 and decoder elements 60 and 62, thus, the digital camera of Meyers '535 must include a timing generator to drive the plurality of pixel areas 22 and control unit, such as microcomputer must be inherent to the digital camera system of Meyers '535).

Conclusion

4. This is a RCE of applicant's earlier Application No. 09/976,096. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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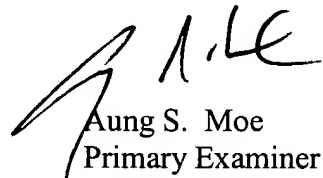
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aung S. Moe whose telephone number is 571-272-7314. The examiner can normally be reached on Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Aung S. Moe
Primary Examiner
Art Unit 2685

A. Moe
February 20, 2006